Refluxul venos, componenta esentiala hemodinamica in BVC

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Mecanisme fiziopatologice in BVC

- Hipertensiunea venoasa cronica (ambulatorie)

- **Mecanisme:**

-refluxul venos

-ocluzia trombotica

-pompa musculara ineficienta

-malformatii vasculare

-fistula A-V

AVP-Ambulatory Venous Pressure
The gold standard
-a global hemodynamic test

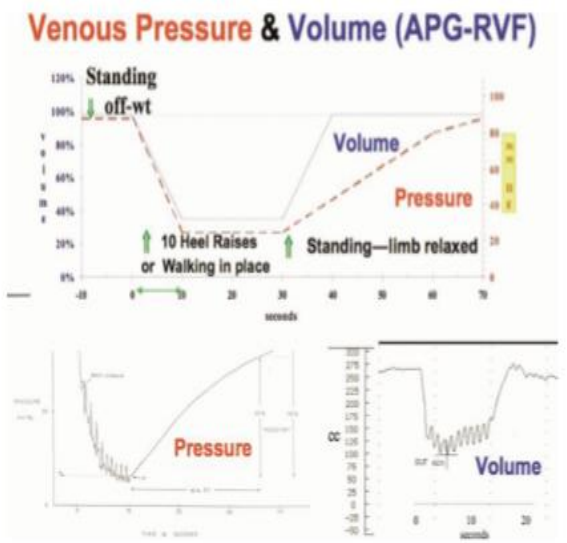


Fig 8. The pressure and volume changes with activation of the calf muscle pump are demonstrated. Beginning in the standing posture, the hydrostatic pressure baseline is demonstrated in a dependent, but non-weight bearing limb. The subject then performs 10 tip-toe (*heel-raising*) maneuvers and resumes the non-weight bearing posture. **A,** This schematic compares the pressure and volume changes along a concomitant timeline. Note the efficiency of the calf pump in rapidly reducing either volume or pressure upon commencement of muscle activity. Although volume filling begins within 5 to 7 seconds, pressure does not rise substantially for 30 to 40 seconds. Alterations in these relationships can generate chronic, sustained venous pressure elevations, the end products of which are the symptoms and findings of chronic venous insufficiency. **B,** Pressure changes during these maneuvers are illustrated in this recording from cannulation of a dorsal foot vein reported in mm Hg. **C,** Volume changes during these maneuvers are illustrated in this air plethysmographic examination. The volume remaining in the limb after exercise divided by the venous volume standing still is reported as the residual volume fraction (*RVF*, %).

Refluxul venos

- Incompetenta valvulara

Topografie diversa

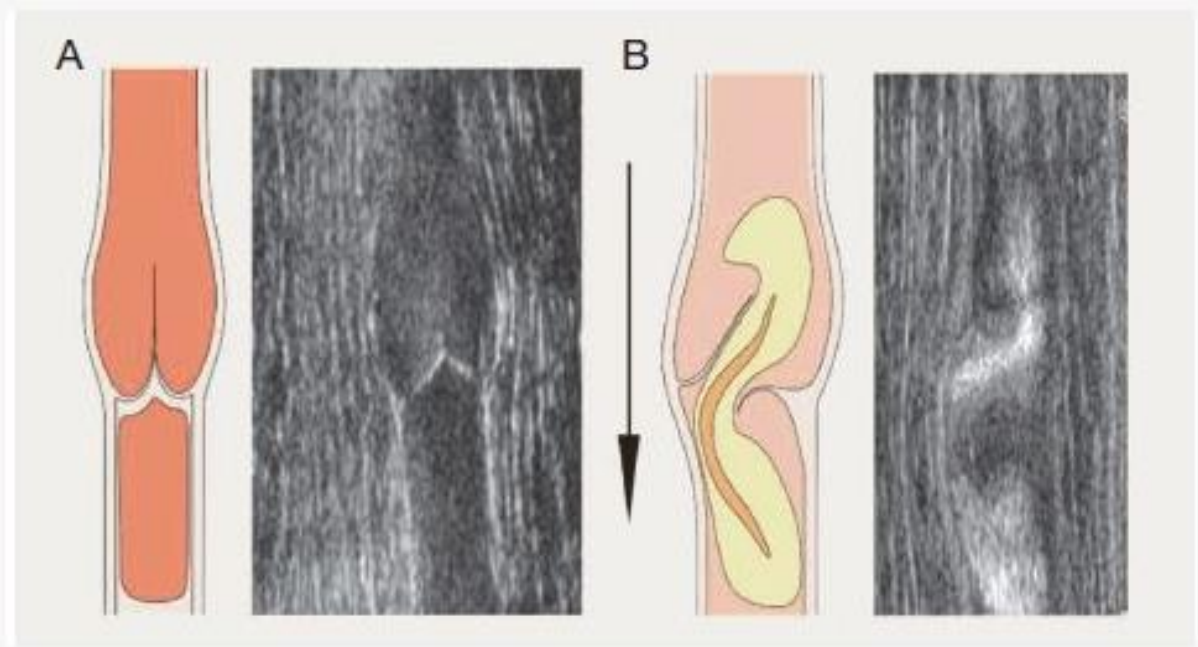


Figure 1. Visualization of competent and incompetent venous valves.

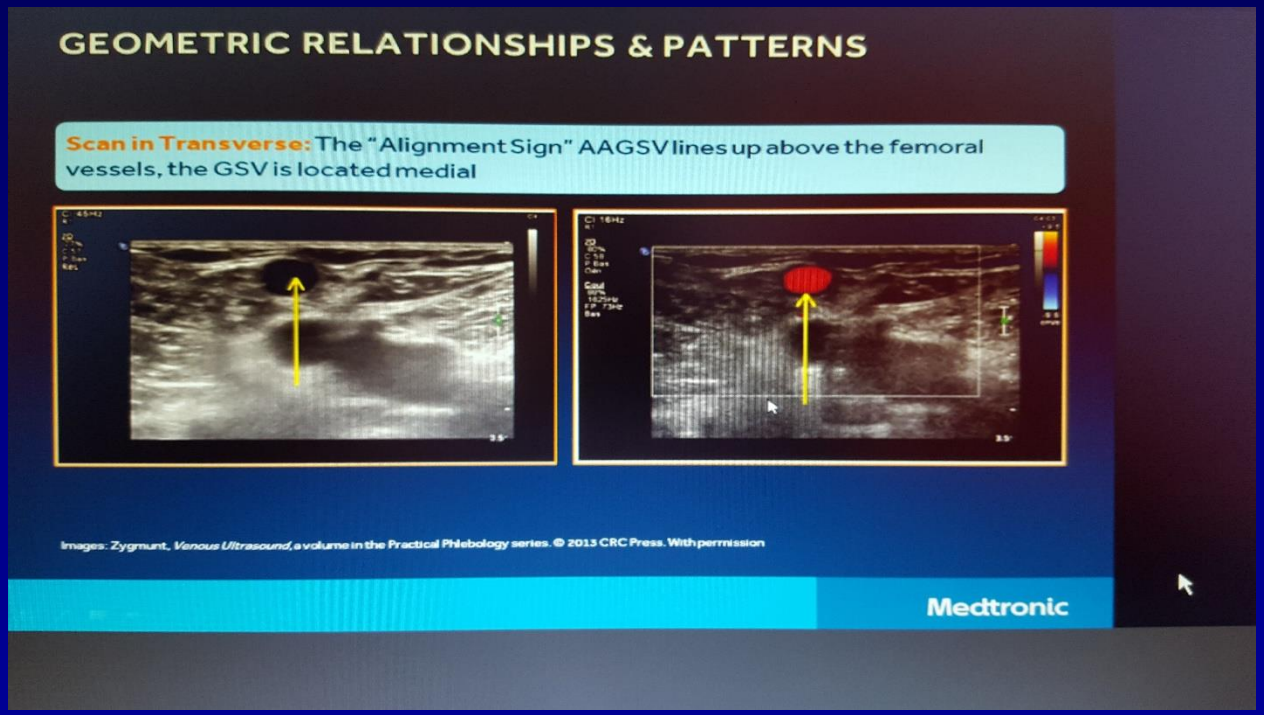
Refluxul venos (cont.)

- **Axial**
- JSF/JSP
- V safena int/ext
- Vv profunde

- **Segmentar**

- **Non-axial**
- VSAA
- VSAP
- perforante
- renala stg
- ovariene
- scrotale/testiculare
- tributare superficiale
- V N. sciatic

V. Safena Accesorie Ant.



Vena N. sciatic

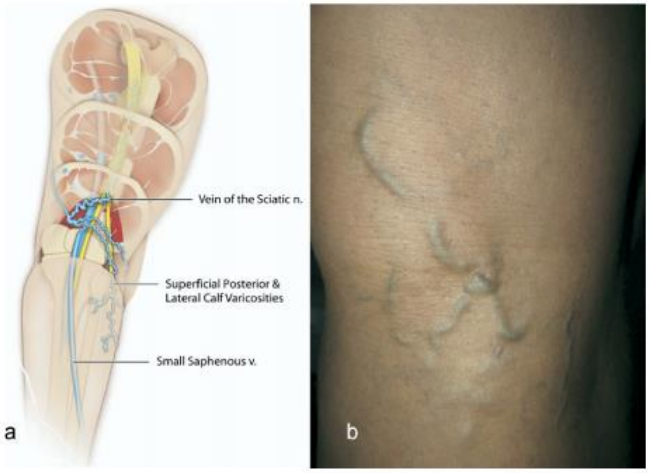
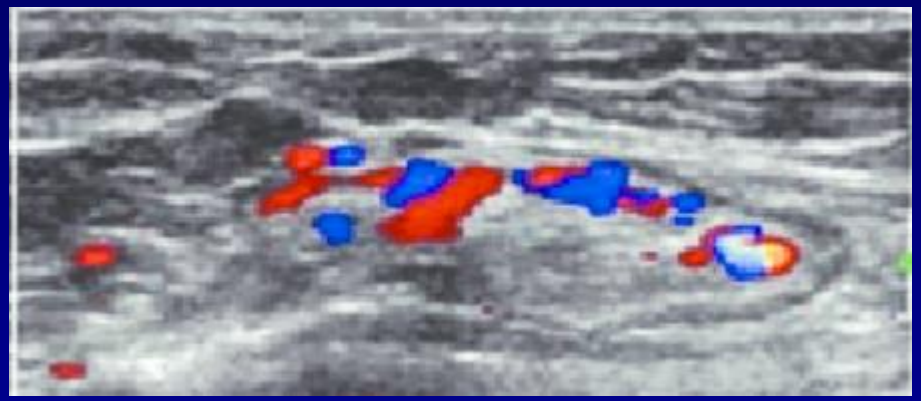


Fig 4. Tributaries in the popliteal fossa emerging from sciatic nerve veins. **a,** Schematic drawing demonstrating varicosities along the sciatic nerve and connections with refluxing veins in the popliteal fossa. **b,** Superficial varicosities in a young female who presented with aching and tingling sensation in the right lower limb.

Labropoulos N - J Vasc Surg 2009

Reflux in placa ganglionara



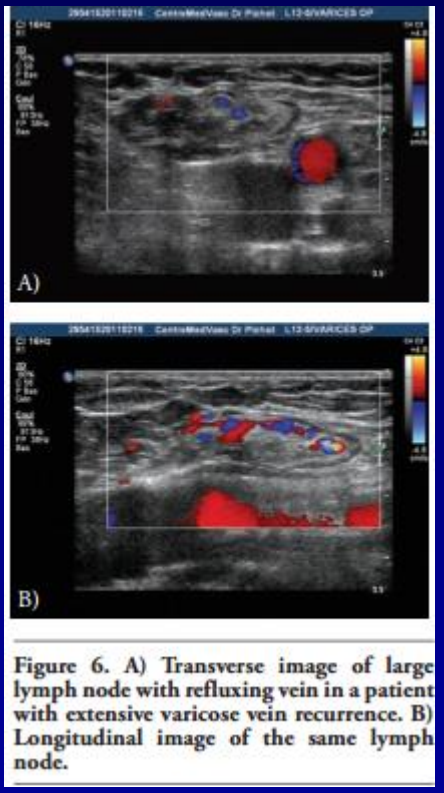
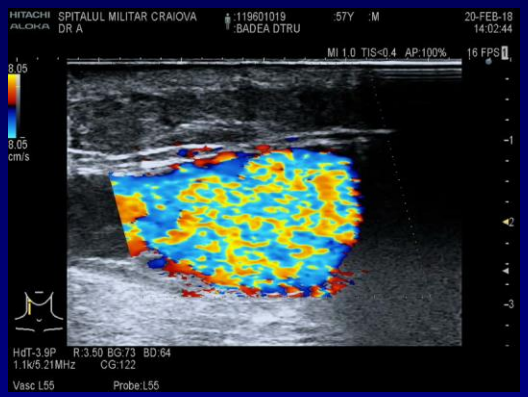


Figure 6. A) Transverse image of large lymph node with refluxing vein in a patient with extensive varicose vein recurrence. B) Longitudinal image of the same lymph node.

De Maeseneer M. Veins and Lymphatics 2012

FAV-Fem
Varice sec



Cauza de flux venos pulsatil

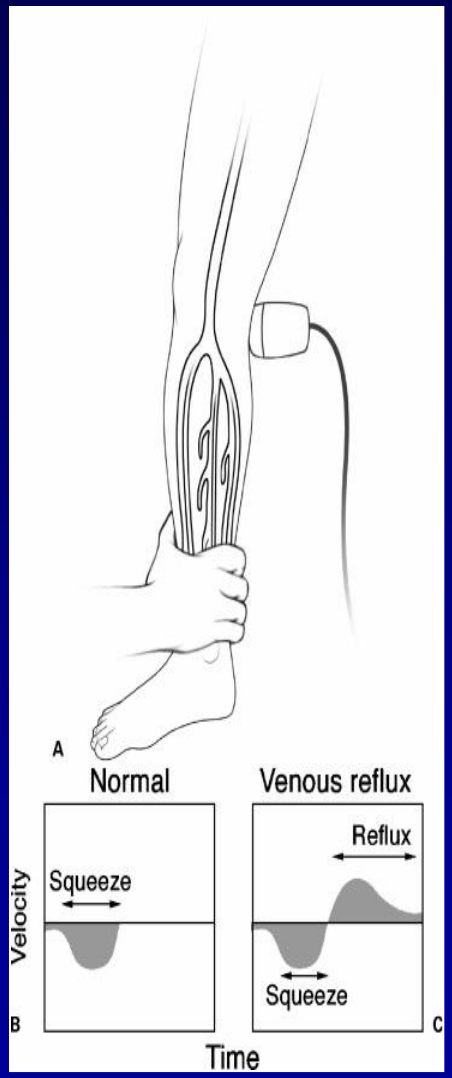
Diagnosticul refluxului

- US Doppler venos
- Pletismografie venoasa
- Venografie (ascendenta)
- Veno-CT
- Veno-MRI

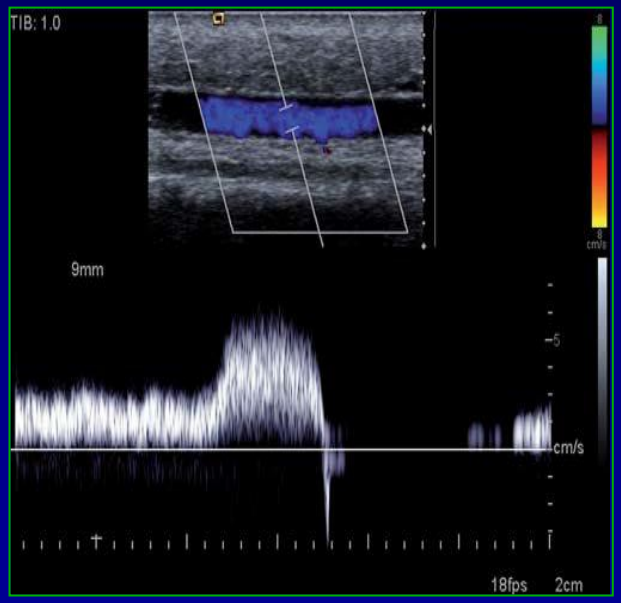
Doppler-reflux venos

Manevre (in ortostatism !):

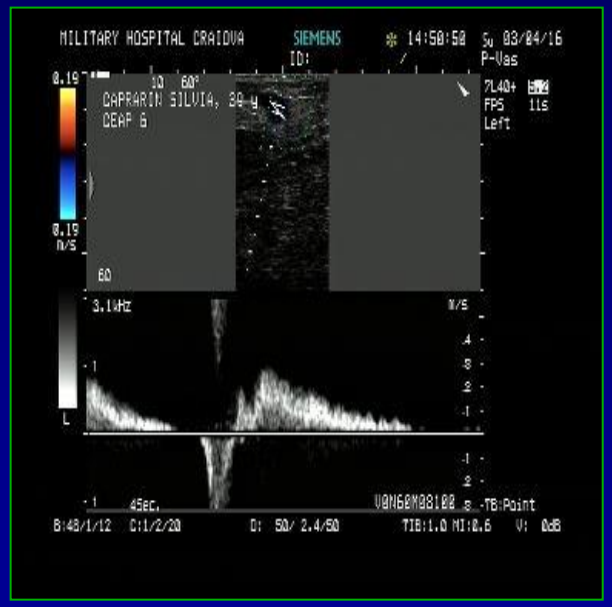
- Valsalva
- Squeeze
- Flexii dorsale ale piciorului
- Pompa mecanica
- Parana



Competenta valvulara

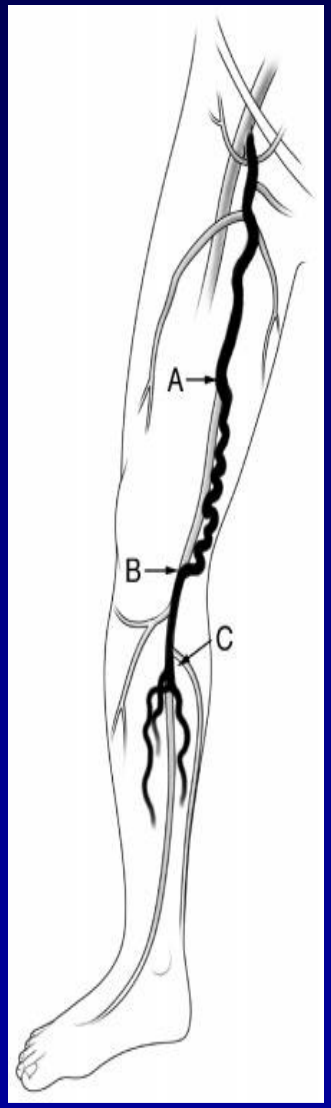


A) Competenta

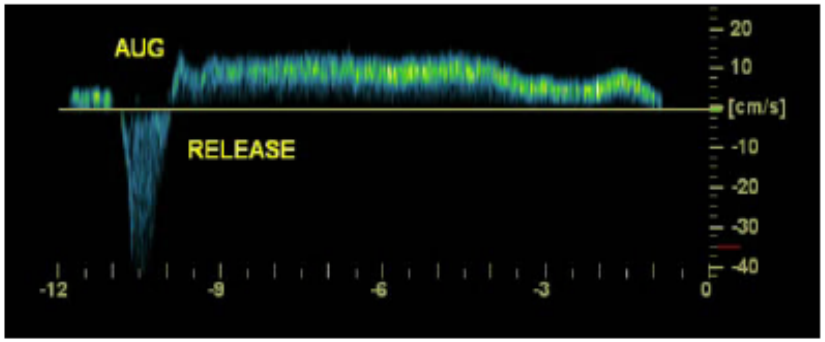


B) Incompetenta

Reflux pathway (venous mapping)



Reflux Values[1]



reflux : measured during muscular diastole

Fem – Pop	>1000ms
calf +DFV	> 500ms
Superficial	**> 500ms**
perforators	> 350ms
	>500ms[2]

[2]pathologic – adjacent to ulcer

[1]Labropoulos, N et al. Definition of Venous Reflux, J Vasc Surg 2003;38:793-8
[2]Gloviczki, et al SVS, AVF clinical practice guidelines J Vasc Surg 2011;53:2S-48S

Prevalenta refluxului venos

Table 2. Prevalence of saphenous and non-saphenous tributary reflux.

	n	%
GSV	111*	65
LSV	33	19
GSV + LSV	12	7
Non-saphenous veins	15	9
Total	171	100

GSV: greater saphenous vein; LSV: lesser saphenous vein.
*$p<0.0001$ for all comparisons.

Labropoulos N – *Eur J Endovasc Surg 1999*

Edinburg Vein Study

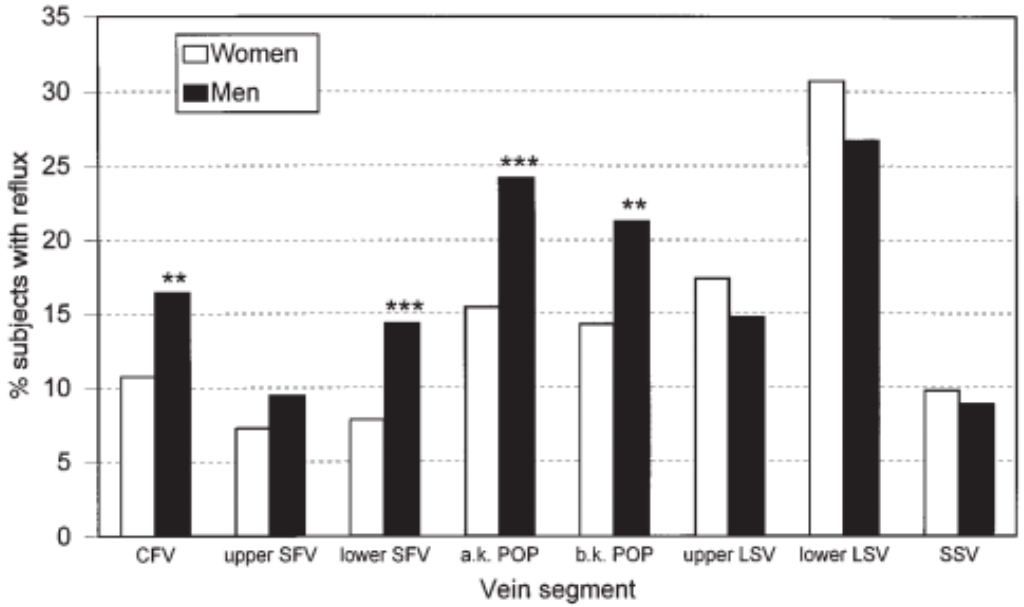


Fig 1. Proportion of participants with reflux of 0.5 seconds or more duration in either leg at individual vein segments, by sex (adjusted for age). *CFV,* common femoral vein; *SFV,* superficial femoral vein; *a.k. POP,* above knee popliteal; *b.k. POP,* below knee popliteal; *LSV,* long saphenous vein; *lower LSV,* lower thigh LSV; *SSV,* short saphenous vein.

Conclusion:

The prevalence of venous reflux in the general population was related to the presence of “venous disease,” although it was also present in those without clinically apparent disease.

There was a higher prevalence of reflux in the deep veins in men than the deep veins in women.

Evans C et al. J Vasc Surg 1998

APG-an old method

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Venous Plethysmography: Measuring Techniques and Normal Values

J. P. Pointel, M.D., H. Gin, M.D., P. Drouin, M.D., G. Vernhes, M.D., and G. Debry, M.D.

NANCY, FRANCE

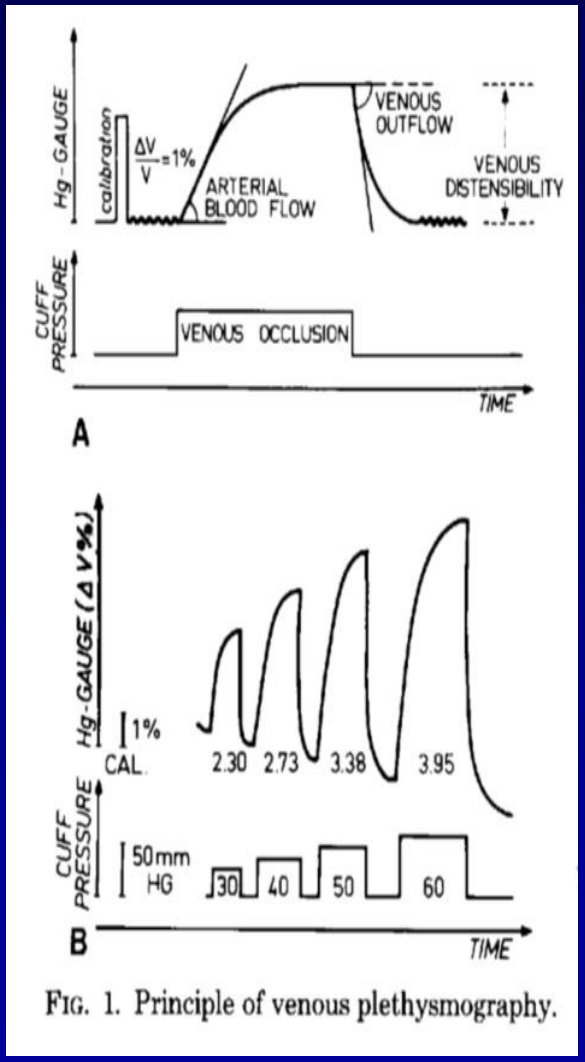


FIG. 1. Principle of venous plethysmography.

Air plethysmography (APG)

- Air plethysmography is a non-invasive test that can quantify venous reflux and obstruction by measuring volume changes in the leg
- Its findings correlate with clinical and hemodynamic measures
- It can quantitatively assess several components of venous hemodynamics: valvular reflux, calf muscle pump function, and venous obstruction
- Is time-consuming
- Lack of standardization
- In present, used in rare situations

APG -parameters

- **EF** ejection fraction

(correlated with muscle pump function)

- **EV** ejection volume
- **RV** residual volume
- **RVF** residual volume fraction

(correlated with ambulatory venous pressure)

- **VFI** venous filling index

(correlated with venous reflux)

- **VFT** venous filling time
- **VV** venous volume

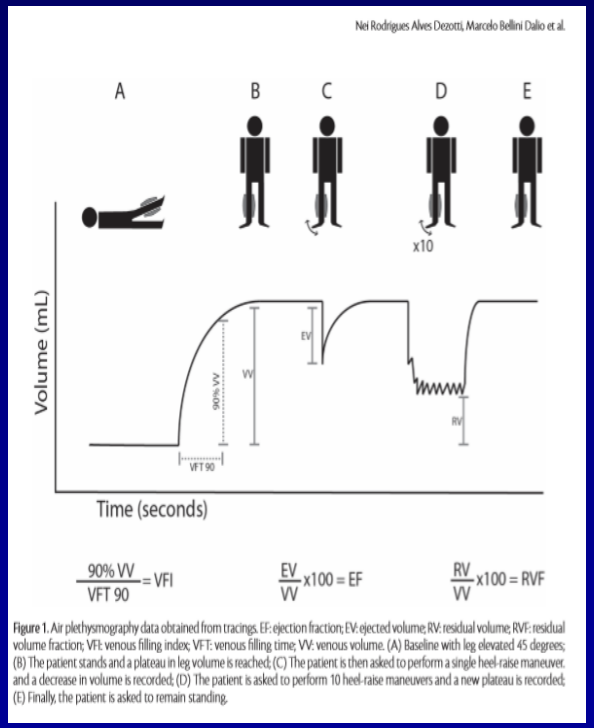
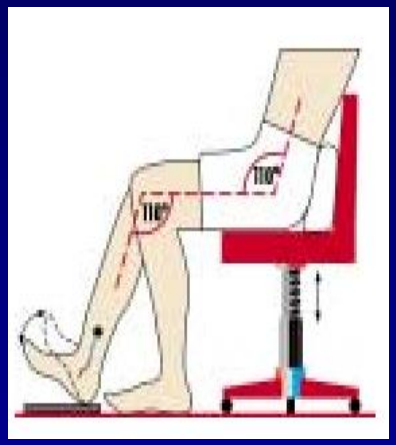


Figure 1. Air plethysmography data obtained from tracings. EF: ejection fraction; EV: ejected volume; RV: residual volume; RVF: residual volume fraction; VFI: venous filling index; VFT: venous filling time; VV: venous volume. (A) Baseline with leg elevated 45 degrees; (B) The patient stands and a plateau in leg volume is reached; (C) The patient is then asked to perform a single heel-raise maneuver, and a decrease in volume is recorded; (D) The patient is asked to perform 10 heel-raise maneuvers and a new plateau is recorded; (E) Finally, the patient is asked to remain standing.

PPG-Method



PPG – Photoplethysmography Test For Varicose Veins

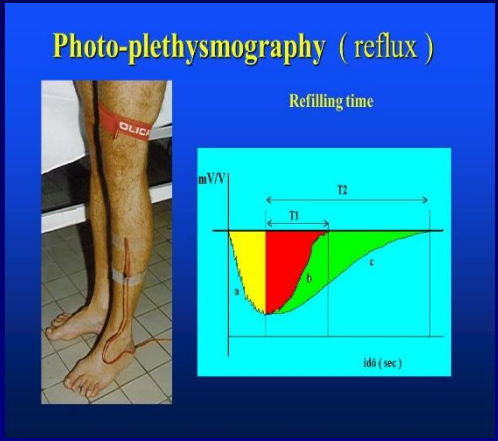
Photoplethysmography (PPG) utilizes a transducer that emits infrared light from a light emitting diode into the dermis.

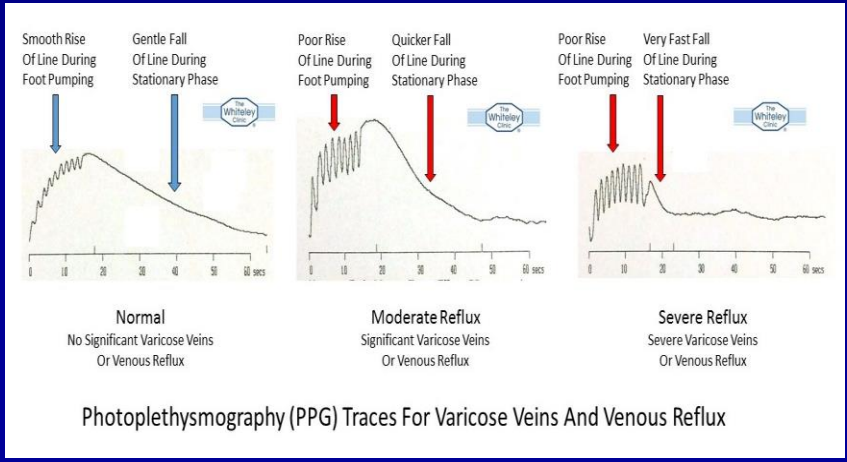
The backscattered light is measured by an adjacent photodetector and displayed as a line tracing.

The amount of backscattered light varies with the capillary red blood cell volume in the dermis.

PPG-parameter

- VRT: venous refilling time
- normal value: >20-25 s
- severe reflux: < 10 s





Photoplethysmography (PPG) Traces For Varicose Veins And Venous Reflux

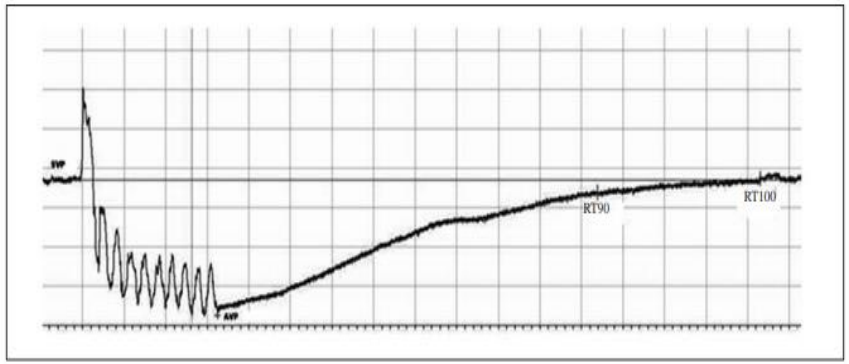
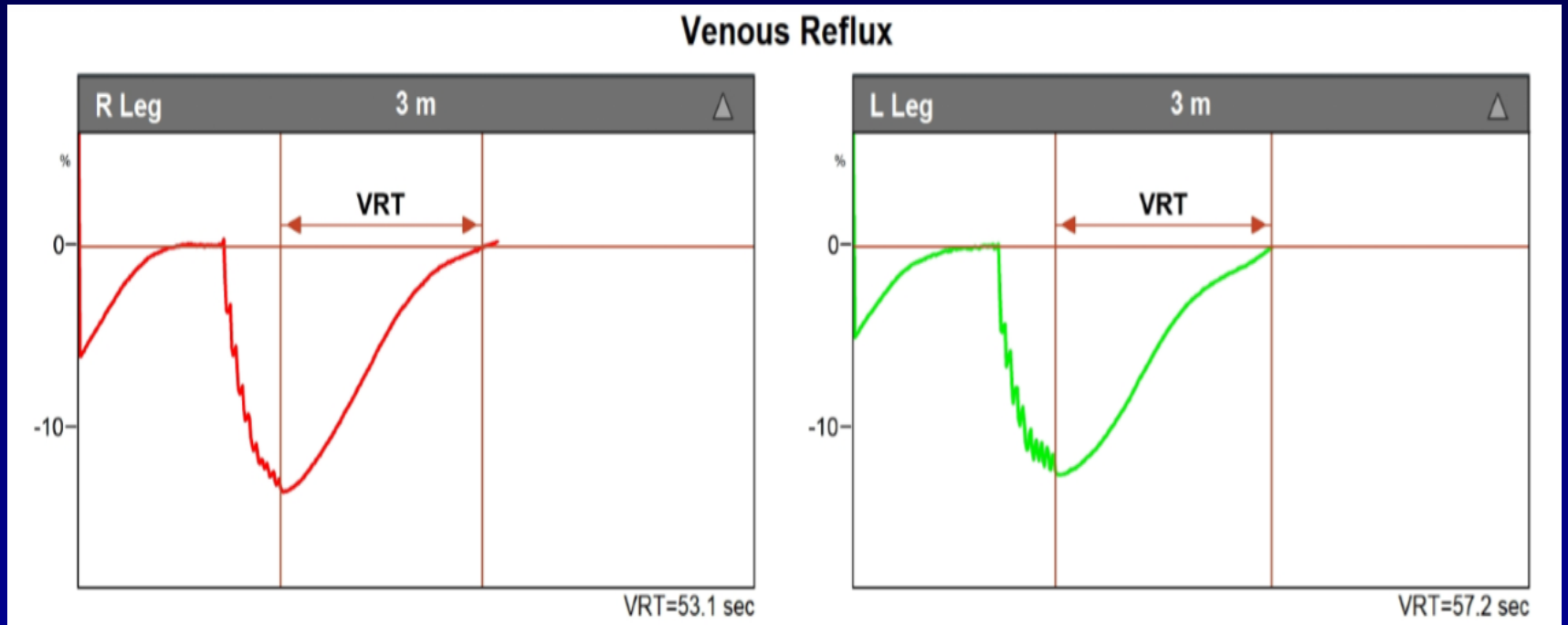


Figure 1.—AVP measurement and definitions (normal individual). X-axis: time (seconds) ; Y-axis: venous pressure (mmHg); SVP: standing venous pressure; AVP: ambulatory venous pressure, as used up till now (deepest point of pressure drop); RT90: venous refill time to 90% of SVP; RT: venous refill time to SVP.

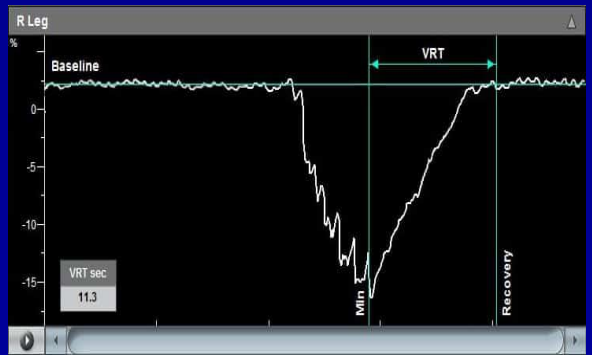
Traseu PPG normal

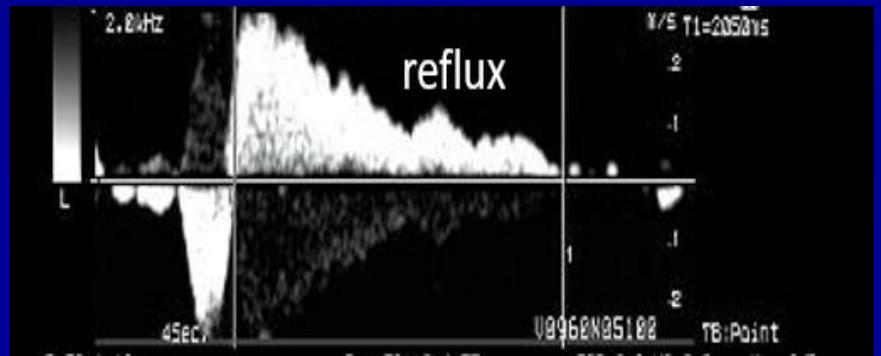


Test	Avg R VRT (Sec)	Avg L VRT (Sec)
VR	53.1	57.2

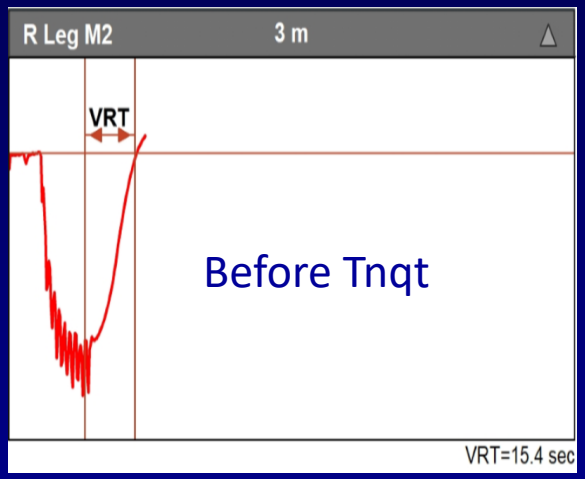
PPG & CDUS

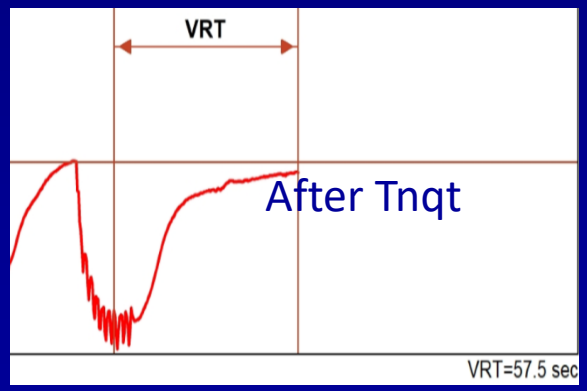
FALCON PRO

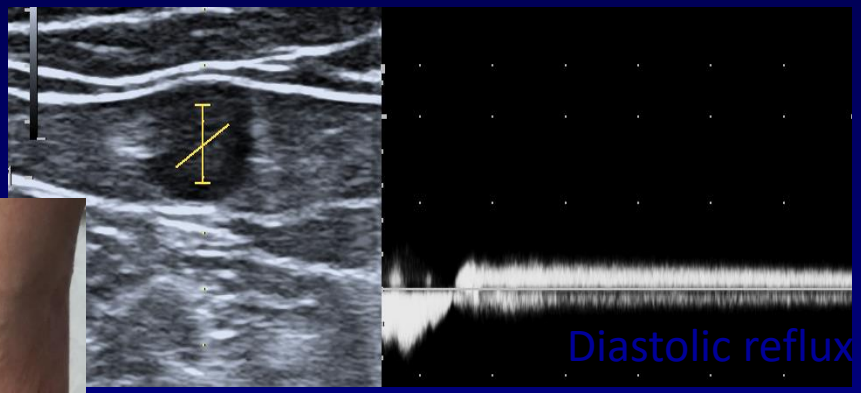




Incompetenta V. Safene int.







Atipii

- V safena de calibru crescut fara reflux
- V Safena de calibru normal cu reflux
- V safena competenta cu reflux in tributare
- V safena competenta cu reflux izolat intr-o perforanta

Concluzia:

- **Refluxul poate sa apara in oricare dintre vene, fara a avea obligatoriu o sursa de alimentare**

Progresia refluxului venos

- Extensia refluxului pre-existent
- Reflux intr-o noua localizare

- Teoria descendenta
- Teoria ascendenta

Labropoulos N-J Vasc Surg 2005

Refluxul axial profund

- Prezenta refluxului axial profund accentueaza severitatea refluxului superficial in V. Safena interna
- Ablatia v. Safene interne reduce refluxul venos profund (segmentar) in 24% din cazuri
- Relatia anatomica prin vv perforante

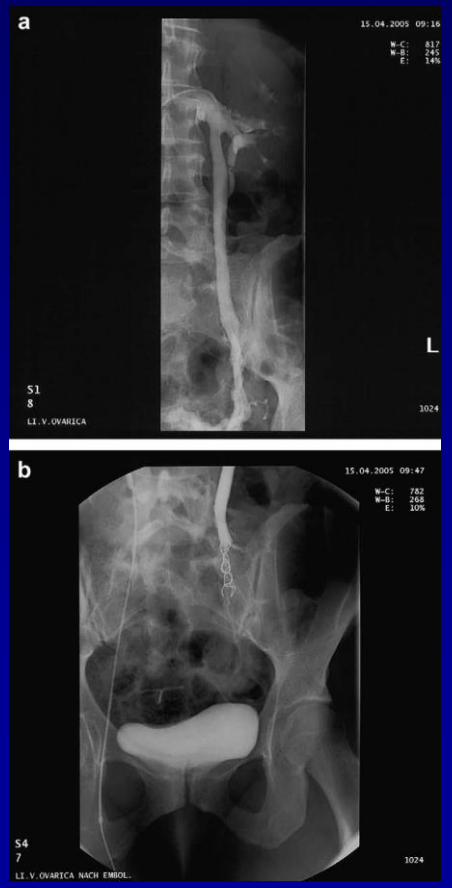
Puggioni A - J Vasc Surg 2003

Pelvic Venous Incompetence: Reflux Patterns and Treatment Results

G. Asciutto [a,*], K.C. Asciutto [b], A. Mumme [a], B. Geier [a]

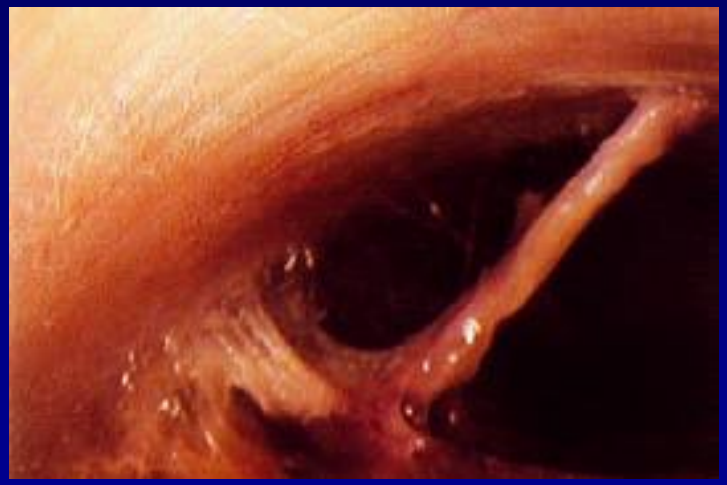
[a] Department of Vascular Surgery, Ruhr-University Bochum, St. Josef Hospital, 44791 Bochum, Germany
[b] Department of Gynaecology, Evangelisches Krankenhaus Oberhausen, 46047 Oberhausen, Germany

- v. renala-ovariana stanga
- v. iliaca dreapta
- extensia refluxului spre m. infer. (60%)
- frecv. la multipare
- Tratament interventional: coil embolisation

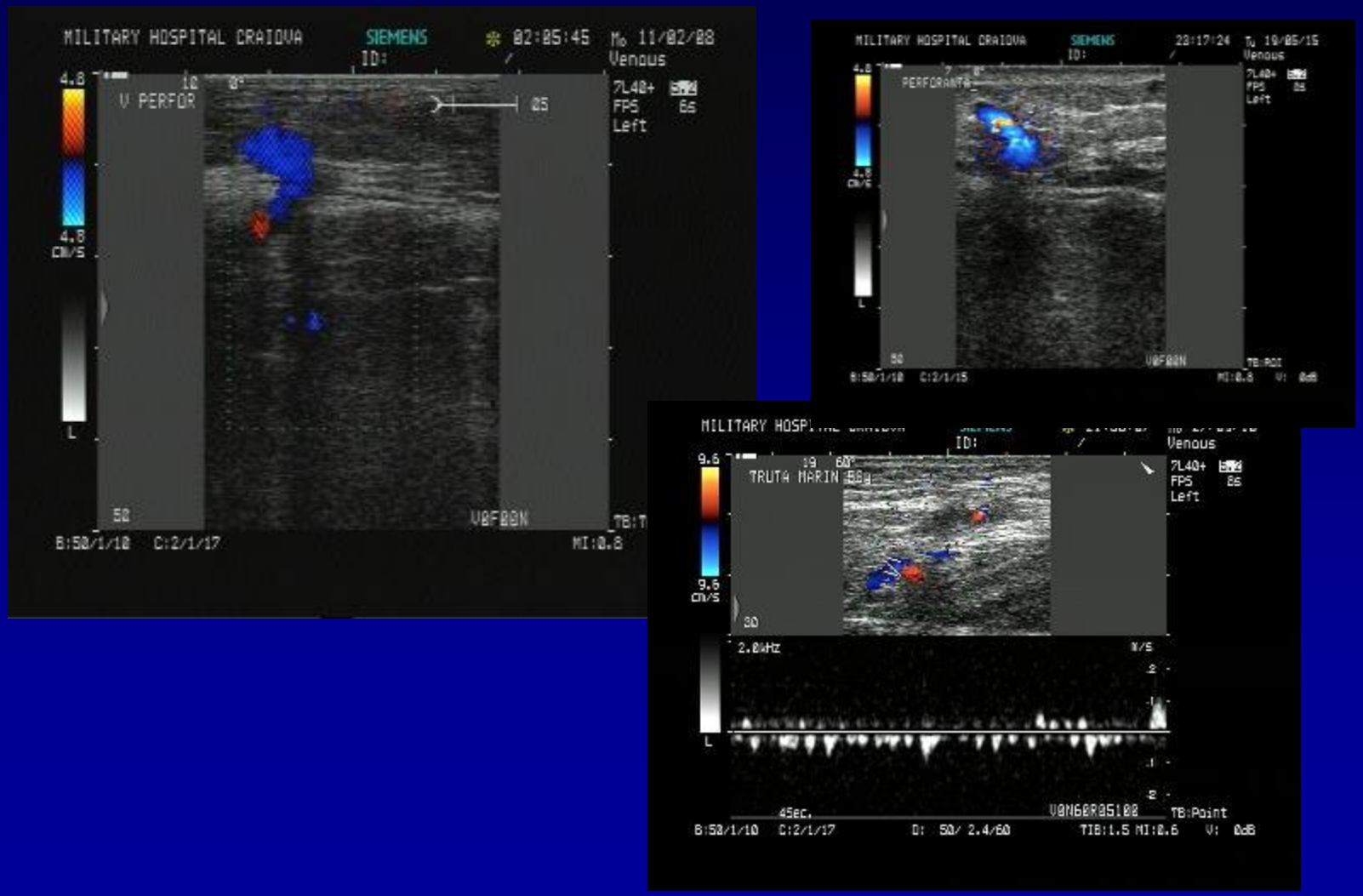


Perforantele incompetente

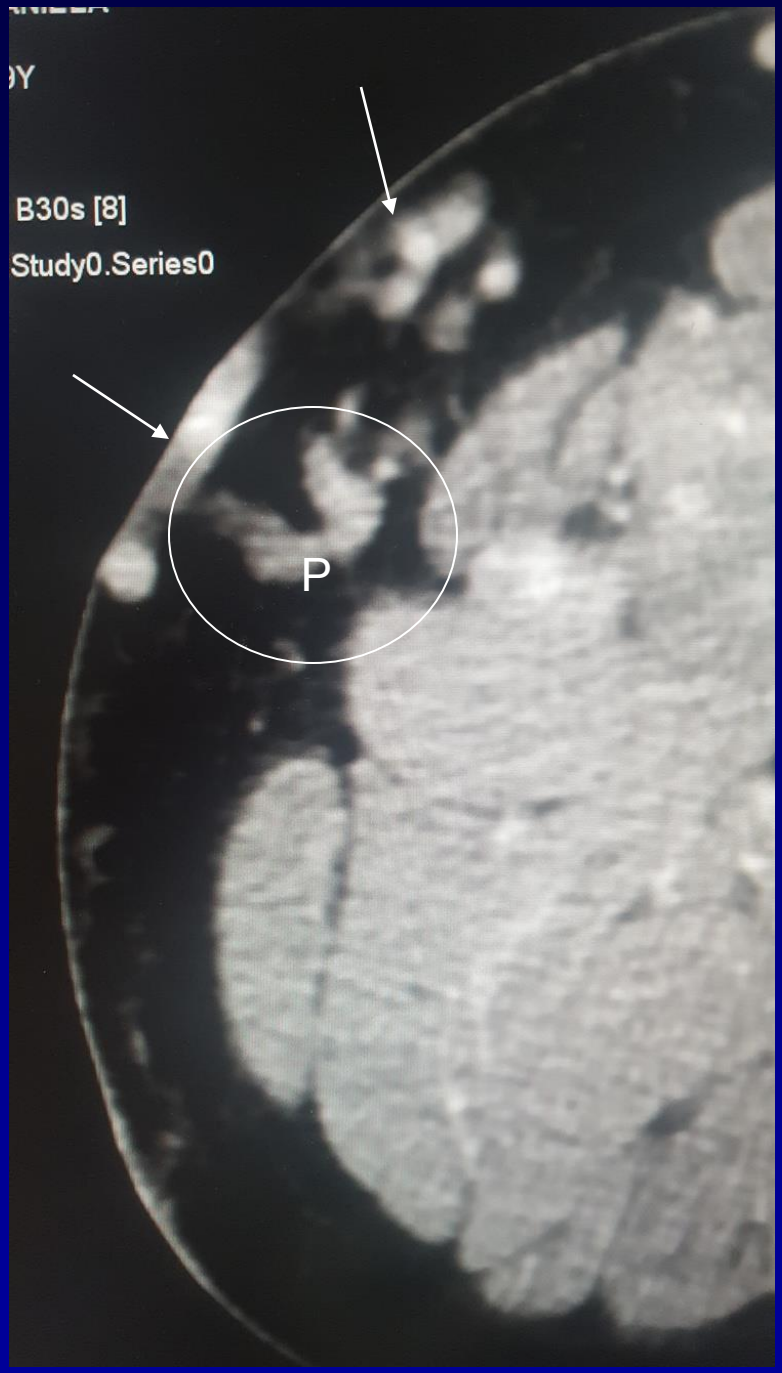
- D>3.5 mm-reflux (++)
- Asociaza frecvent incompetenta v safene
- Corectarea refluxului perforantelor trebuie asociata ablatiei v safene incompetente!



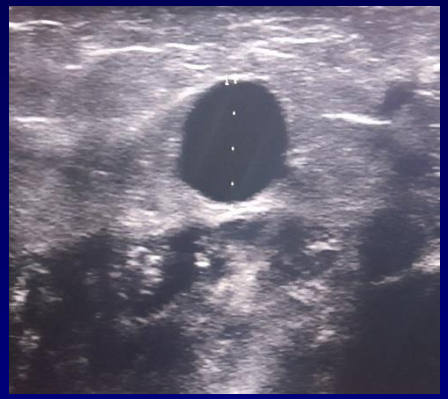
Doppler v. perforanta

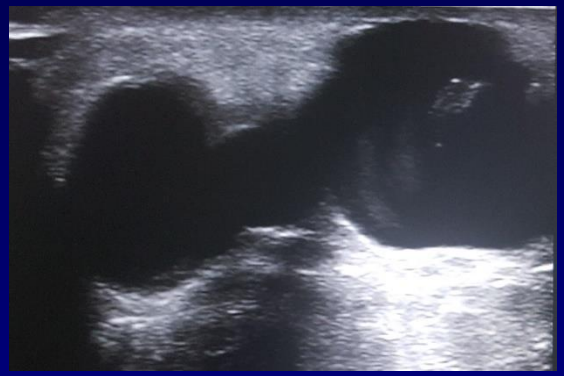


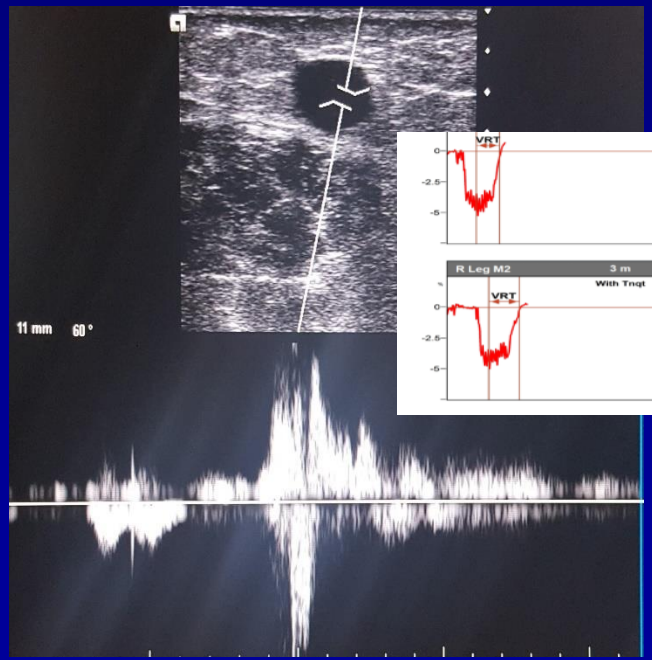
Angio-CT
REVAS
P-perforanta

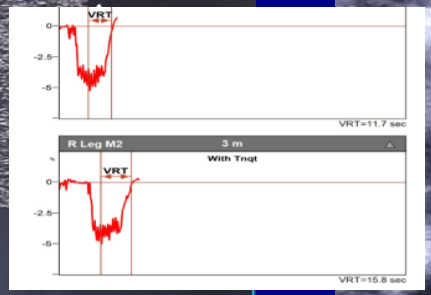


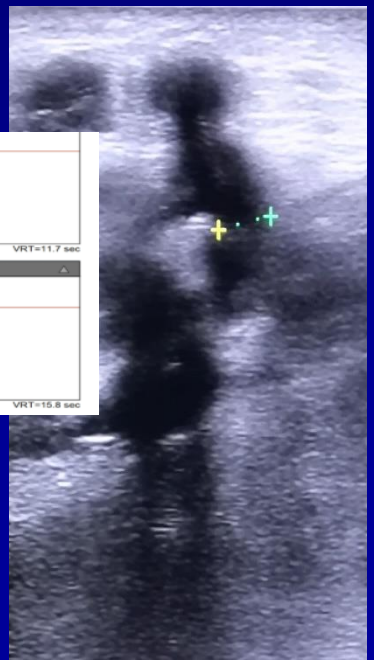
R-GSV incompetence with varicose veins and perforator incompetence



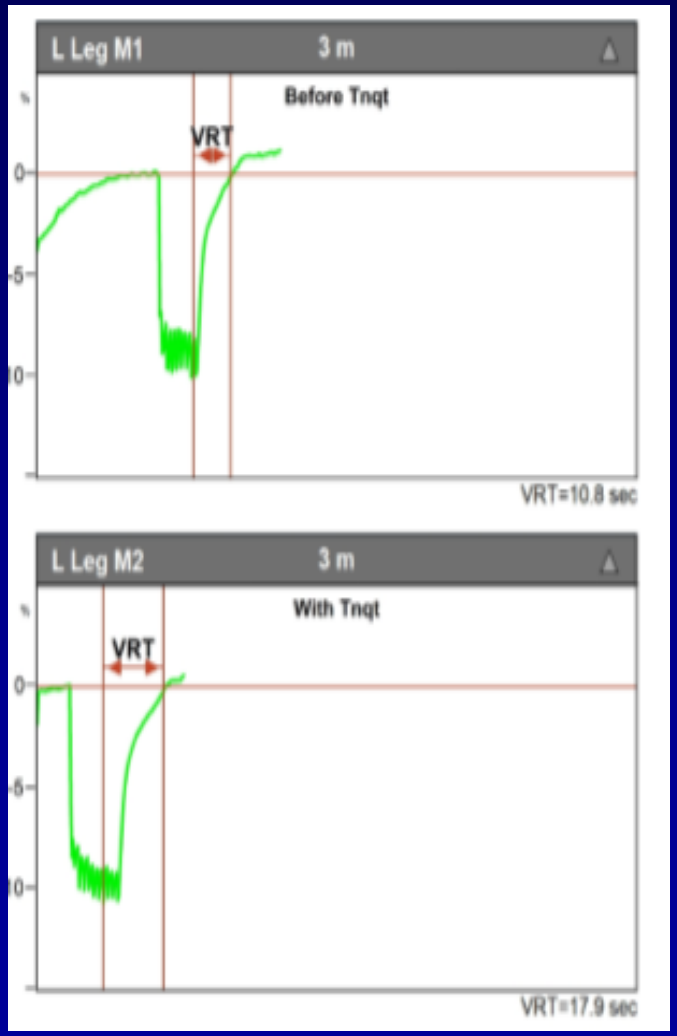




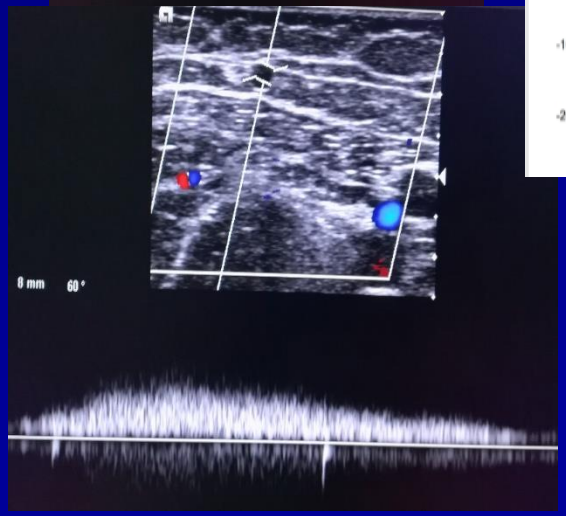


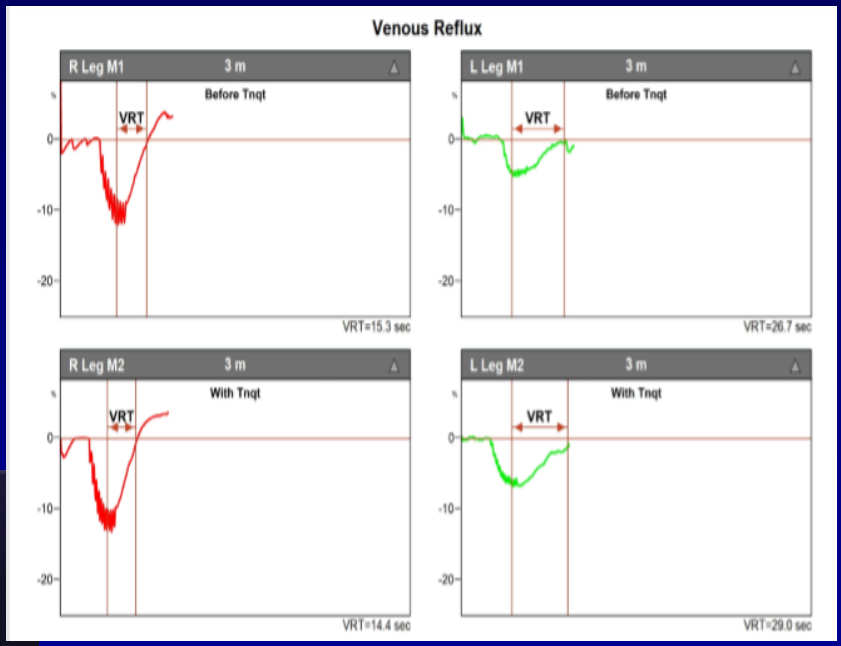


DVT post-GSV stripping
CVI from PTS,
Superficial and Perforator incompetence

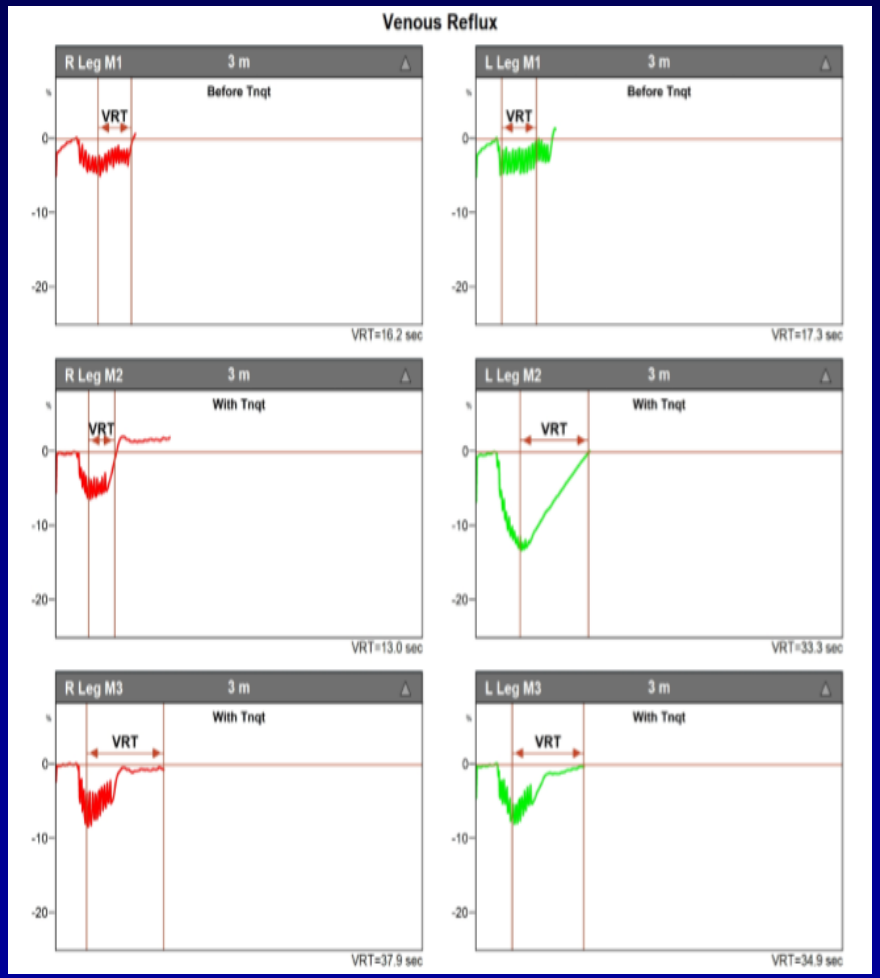


R-GSV reflux
L-AASV reflux



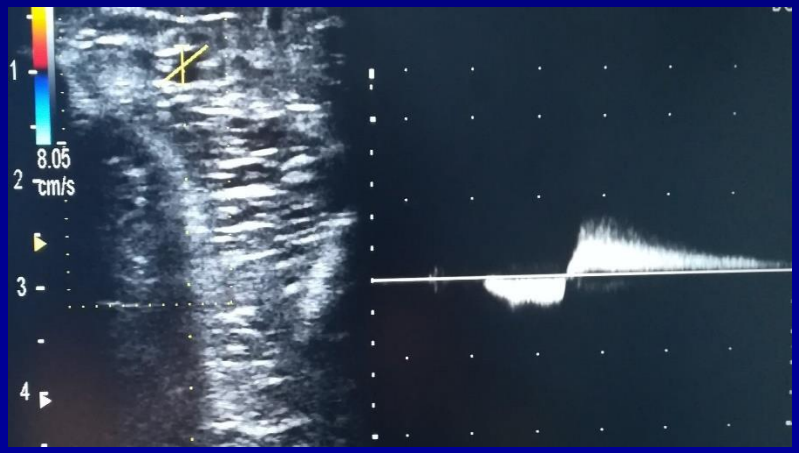


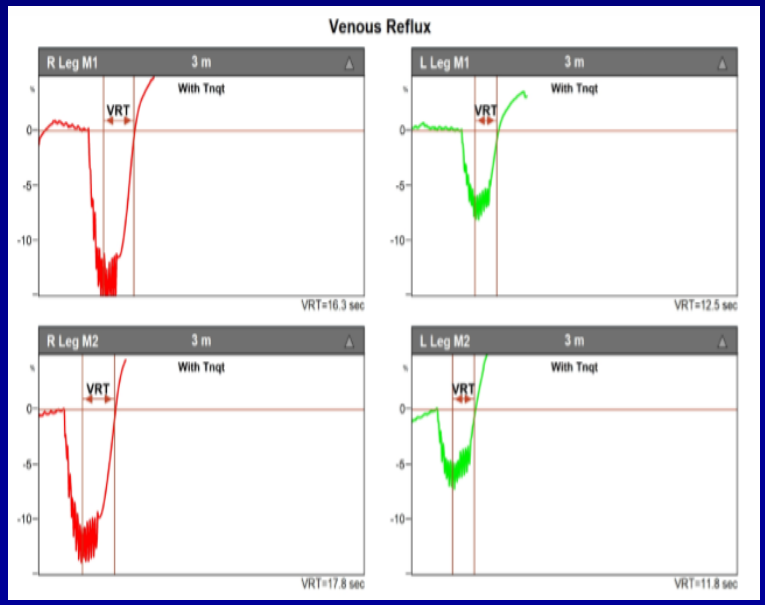
Bilateral CVI-CEAP 4Cls.
Large varicose veins



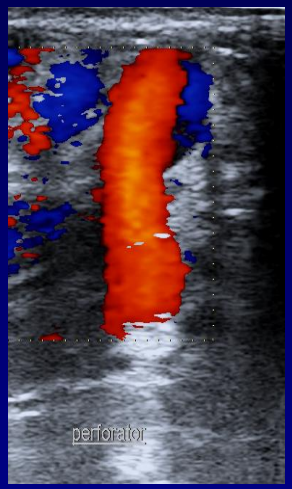
CoS-CEAP Cls.

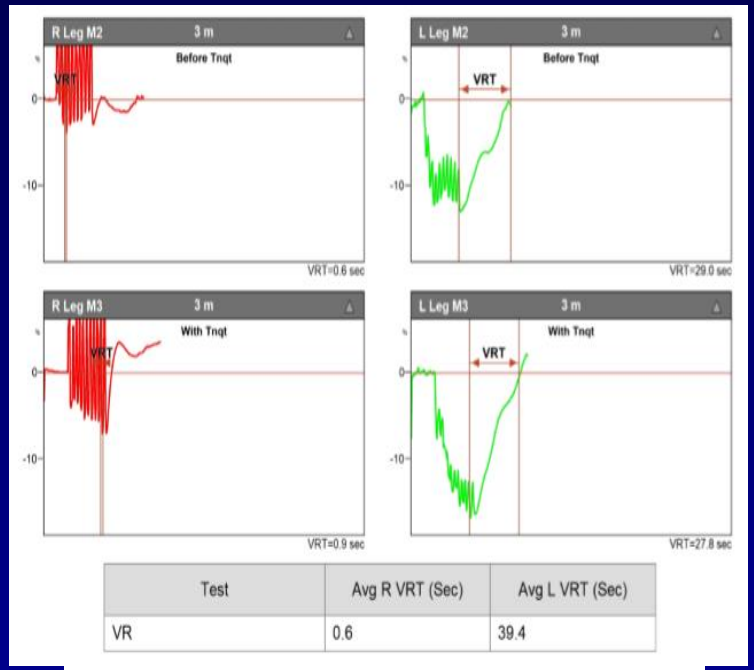
- Female, 42 yr
- Legs symptoms (++)
- No signs for CVD
- CDUS-bilateral GSV reflux (L>R)





PTS-R Leg





Test	Avg R VRT (Sec)	Avg L VRT (Sec)
VR	0.6	39.4

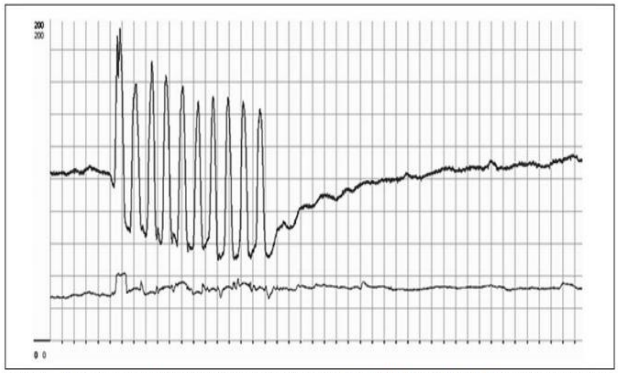
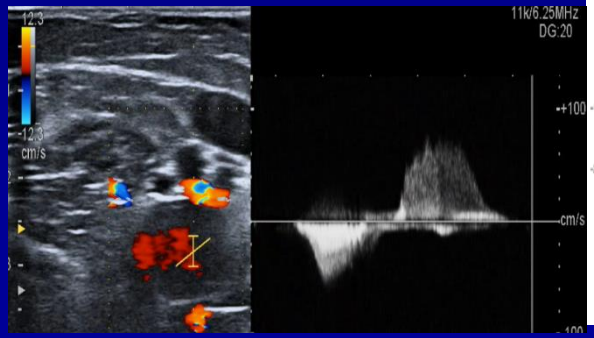
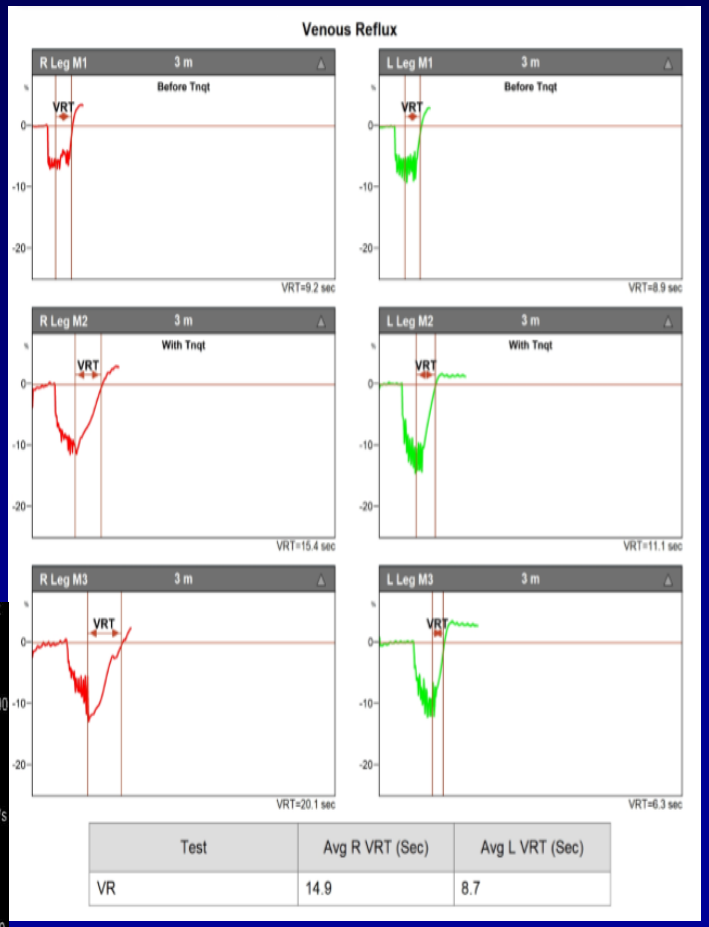


Figure 2.—AVP curve in a patient with a severe postthrombotic syndrome. AVP defined as (systolic pressure + 2 x diastolic pressure)/3=98.

R-leg venous ulcer
bilateral GSV insufficiency (reflux)
more severe in L-leg (deep reflux)

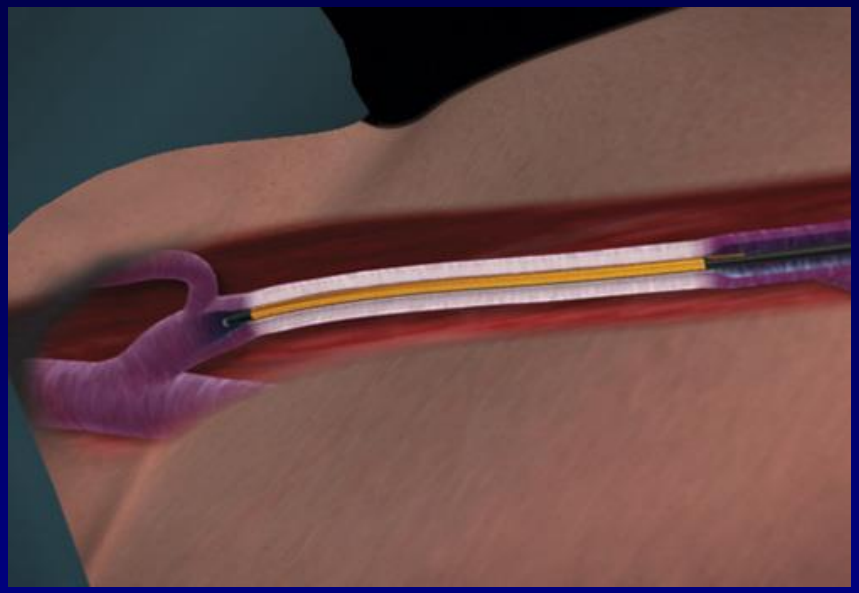




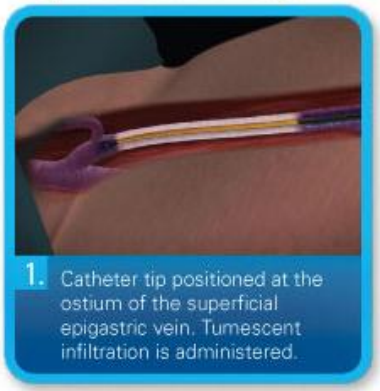
Test	Avg R VRT (Sec)	Avg L VRT (Sec)
VR	14.9	8.7

Tratament

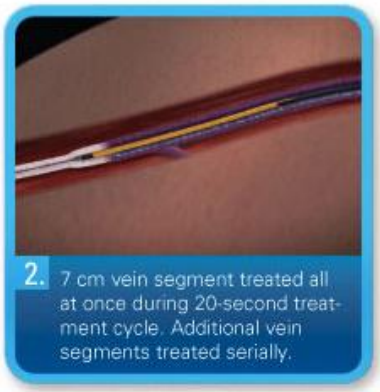
- Contentie elastica graduala
- Venotonice
- Ablatie termica/chimica
- Stripping



Key Procedure Steps

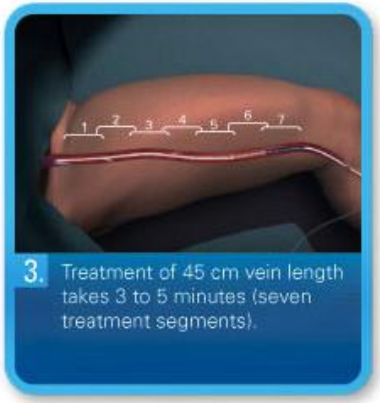


1. Catheter tip positioned at the ostium of the superficial epigastric vein. Tumescent infiltration is administered.



2. 7 cm vein segment treated all at once during 20-second treatment cycle. Additional vein segments treated serially.

3. Catheter shaft markings allow fast and accurate catheter re-positioning between treatment cycles. No energy is delivered during re-positioning.



3. Treatment of 45 cm vein length takes 3 to 5 minutes (seven treatment segments).

VNUS ClosureFast

for Treatment of Venous Reflux

COVIDIEN

RFA


MILITARY HOSPITAL CRAIOVA
SIEMENS
22:38:14
28/06/15
ID:
P-Vas
7L40+
FPS 11s
Left
MARINEANU EMIL, 59
RFA
9.5
9.5 cm/s
TB:Point
B:48/1/12 C:1/2/ 8
MI:0.8 V: 0dB

Fara concluzii…